Data How You Want It

“PYMONGO + MONGODB == YOUR_DATA_BACKEND”

```
discussion_topics = ('MongoDB', 'pymongo', 'FastAPI')
```

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What's Up, Doc?

MongoDB stores documents. Documents are self describing representation of your data.

```
{
  "theater": "Aero",
    "day": { "$date": "2025-01-01" },
    "sales": [
      { "movie": "Elf", "tickets_sold": 111 },
      { "movie": "Die Hard", "tickets_sold": 222 }
    ]
  }
```

This document was designed to store the number of tickets sold for a movie in a theater on a certain day.

BSON ~= JSON

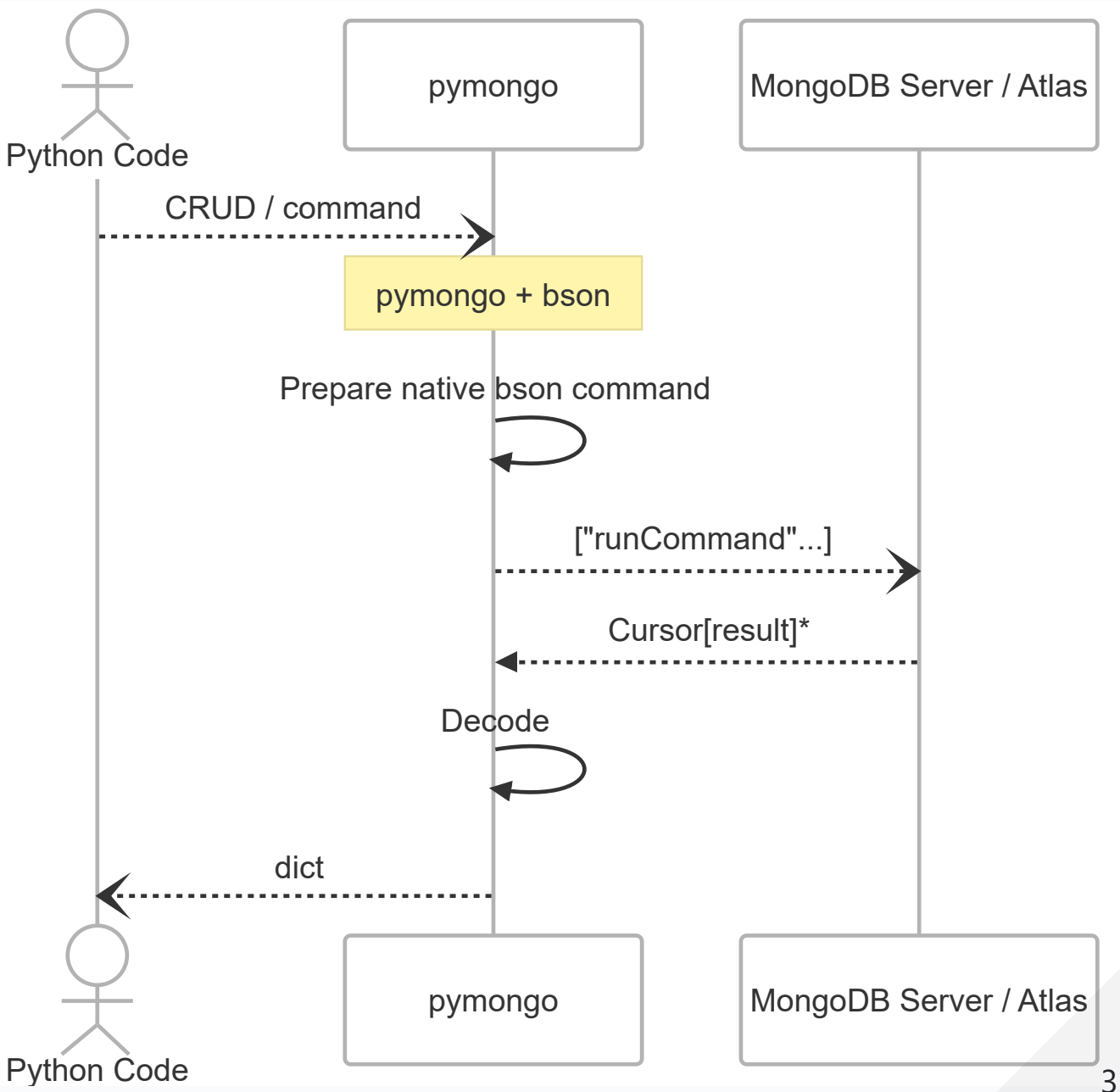
JSON is nice, but skimps on native data types.

Field	BSON Data Type	Python (in demo)
`theater`	**UTF-8 String**	`str`
`day`	**UTC Datetime**	`datetime.date`
`sales`	**Array**	`list`
`count`	**32-bit integer**	`int`

SEE HTTPS://BSONSPEC.ORG

PyMongo - Driver

- BSON, codec
- Sync / Async
- Cursor
- Connection management



Diving In

- Instantiation scope
- "Connect"
- "Namespace"

Once, Before All

```
from pymongo import AsyncMongoClient

CONNECTION_STRING = os.environ.get("MY_MONGODB_URI", "mongodb://localhost/demo")
```

INSTANTIATE

```
client = AsyncMongoClient(CONNECTION_STRING)
db = client.get_default_database()
```

DO SOMETHING...

```
c1 = db.stuff1

# c2 = db.get_collection("stuff1")
```

Read A Doc

```
async def get_one_theater_sales(day: date, theater: str):
    """Get the sales for a single day."""

    filter = {"_id": f"{day}_{theater.lower().replace(' ','_')}"}

    doc = await db.theater_sales.find_one(filter)
    return doc if doc else None
```

> `FIND_ONE()` RETURNS ONE DOCUMENT MATCHING CRITERIA.

Writing - (Dangerously)

```
await collection.update_one(
    {"_id": data.id},
    {
        "$set": {
            "sales": sales, # a list of sales
            "theater":data.theater,
            "day": date_to_datetime(data.day),
        }
    },
    upsert=True,
)
```

Writing Respecfully

```
await db.theater_sales.update_one(
    {"_id": data.id},
    {
        "$set": {"theater": data.theater, "day": date_to_datetime(data.day)},
        "$push": {"sales": {"$each": [m.model_dump() for m in data.sales]}},
    },
    upsert=True,
)
```

- Previous elements of the `sales` field survive

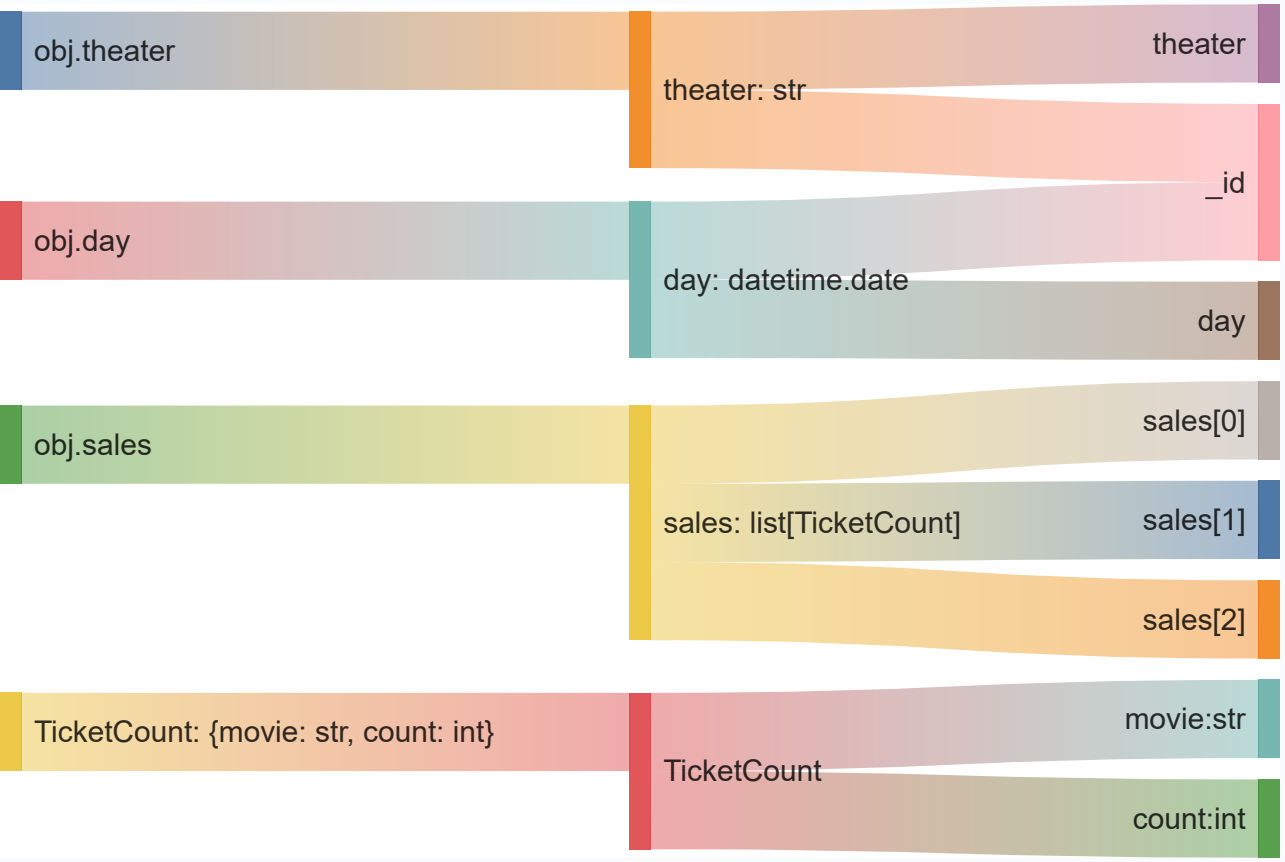
Aggregate - Read More Docs

```
async def multi_day_sales(on_or_after: date, before: date, *breakdown: str):
    filter = date_filter(on_or_after, before)
    unwind = unpivot_sales()
    group = group_by(breakdown)
    flatten = flatten_id()
    pipeline = [filter, unwind, group, flatten]

    return await db.theater_sales.aggregate(pipeline).to_list(None)
```

> PYMONGO **CURSOR** CAN BE ITERATED, AND HIDES BATCHING DETAILS

Pyadantically

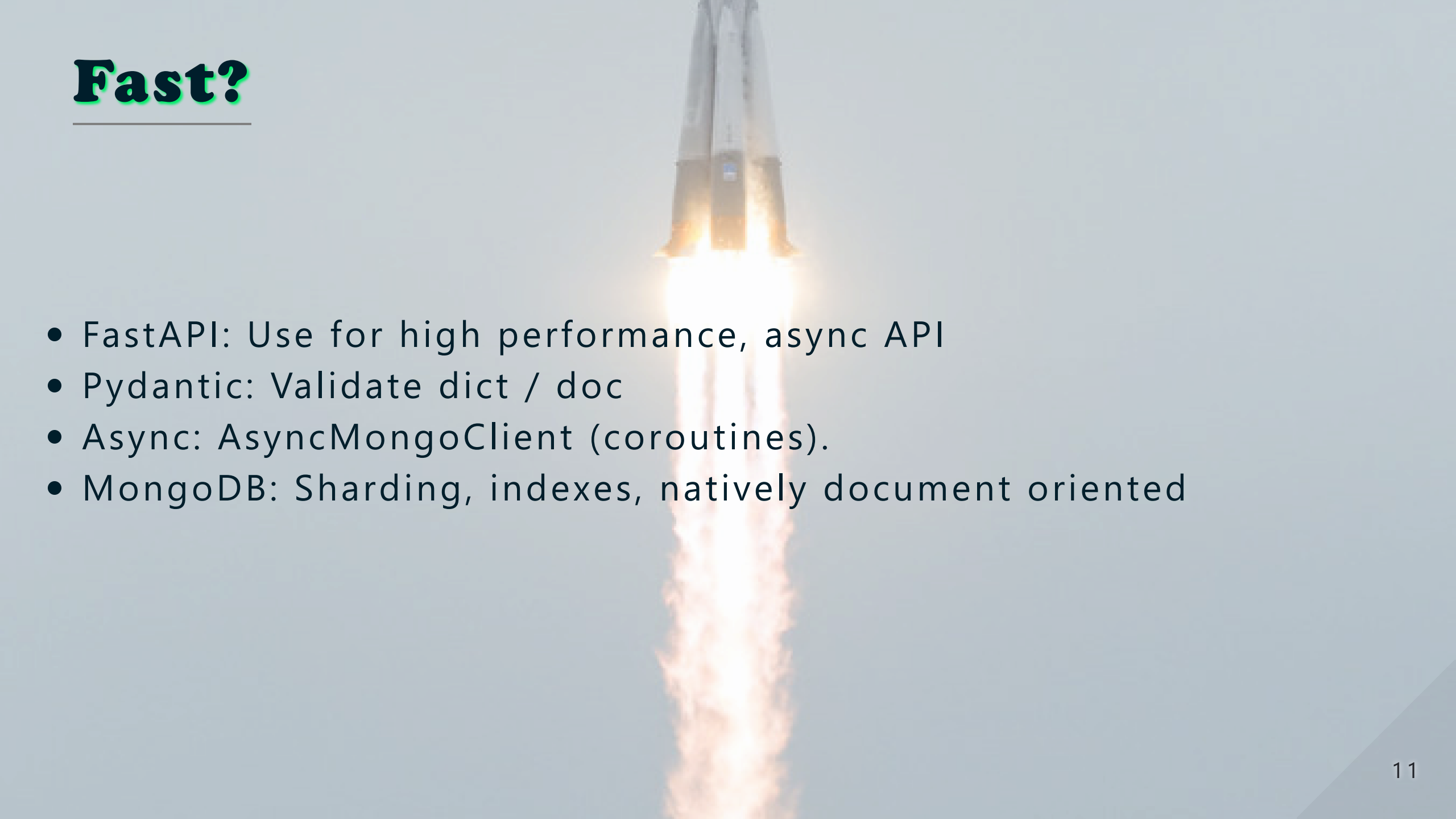



```python
class TheaterSales(BaseModel):
    theater: str
    day: datetime.date
    sales: list[TicketCount] = []

    @computed_field(alias="_id")
    @property
    def id(self) -> str:
        return create_id(self.theater, self.day)

    model_config = {
        "json_schema_extra": { }
    }
```

Fast?



- FastAPI: Use for high performance, async API
- Pydantic: Validate dict / doc
- Async: AsyncMongoClient (coroutines).
- MongoDB: Sharding, indexes, natively document oriented

Resources

1. `pymongo` **pymongo.readthedocs.io**/en/stable/
2. `AsyncMongoClient` /en/stable/api/pymongo/asynchronous
3. `fastapi` **fastapi.tiangolo.com**/
4. MongoDB Community Champions
   mongodb.com/community/champions